CHAPTER X

SUMMARY AND CONCLUSIONS
Anantapur district is facing the worst ecological and environmental crisis. The protection of environment is the primary concern of the people. Deforestation, denudation and drought are the direct offshoots of land misuse. Large chunks of forest area have been diverted for the purposes of agriculture. The hills and hill slopes in the community lands have been assigned to the landless poor for cultivation. The land hunger did not spare the shrinking forest lands. The forests which constitute 10.3 per cent of the district land mass, bears tree growth hardly in one tenth of the area. The per capita forest has rapidly decreased from 0.11 ha in 1961 to 0.06 in 1991 not only in extent, but also in quality.

The agriculture under rainfed conditions is on increase. For economic reasons farmers have switched over to short rotation commercial crops draining the meagre resources of soil nutrients. In the anxiety to bring more area under irrigation, large number of wells are sunk under planned development programmes only to find more number wells going dry year after year and this could be seen in the fluctuating trend in the irrigated area.

There is a terrific shortage of fuel and fodder. Fuelwood is not a problem in the sense it is not imported from outside. But it is a continuous drain on the sparse vegetation. Nearly one third of the animal population is underfed and hence unproductive.

Nearly 50 per cent of the land available is wasteland,
requiring treatment and rest. Ecological restoration of these degraded lands and scientific land husbandry to ensure biological productivity should be the primary concern whether in forest, public or private land.

All our massive social programmes during the last 2 decades resulted in afforestation of nearly 76000 ha of degraded land which hardly comprise four per cent of the geographical area.

It is necessary and obligatory to have a comprehensive land use policy, stipulating the basic principles guiding the allocation of land for different purposes. Land use should be strictly guided by a capability classification so as prevent further deterioration from misuse. Adequate technology is available to practise different methods of agroforestry wherein food and wood could be grown together for mutual benefit, together contributing to the productivity of the land and for ensuring sustainability and profitability of our farming system.

'Tree culture' and not the 'Agriculture' which should receive impetus. The means to be adopted should be as important as the goal perceived. Disincentives should be sanctioned against keeping the land fallow, open and without adequate soil cover and conservation effort.

Real development lies in proper land development. Land is the living resource and should not be used like a hand pump indiscriminately.
The decrease in productivity of natural resources will lead to increase in poverty, misery and uncertainty of life's existence. This is the challenge faced by the district to which government, politicians and voluntary agencies must increasingly respond, if poverty is to be removed where it gets created.

The salient features of the present study are summarised below:

- During the last 101 years, the Anantapur district was affected by drought as many as 49 times. Thus, every alternate year was a drought year causing distress to both cattle and human population and affecting both economy and ecology.

- As long as surface moisture meets the evapo-transpiration rates, the total rainfall and temperature play a role in moisture status of soils. Once the moisture level drops below the evapo-transpiration rates, the vegetation and land management control the soil moisture levels. Thus, in arid conditions, vegetative cover and land management are more important than the total rainfall.

- During six years of drought in this decade, as against a total cropped area of 4.12 million ha during normal years, only 3.25 million ha of area was sown. Thus, about 30 per cent of the crop area was not sown. Out of the area sown, anything between 50-80 per cent of the area was affected by prolonged dry spells and the reduction even in groundnut yield up to 50 per cent.
Due to drought, fifty per cent of the working population of the district is nearly unemployed.

The total fuelwood requirement of the district is 0.7 million tonnes/year. Recurring drought conditions result in the limited availability of agriculture residues increasing dependency on forests and other natural vegetation for fuelwood.

The grazing intensity in the district is more than eight times the permissible limit. Scarcity of fodder during the drought years lead to large scale migration of cattle.

Drought conditions limit the perspective development by shortening the utility of irrigation and drinking wells where 23 per cent of them are not useful. Inspite of the development of irrigation sources over the years from 1966 to 1986, the gross irrigated area has decreased from 0.167 million ha in 1966 to 0.123 million ha in 1986-87.

The production of food crops per capita decreased alarmingly from 358 Kg/ha in 1955 to 83 Kg/ha in 1987. Contrary to it, the per capita production of commercial crops is on the increase, draining the scant soil nutrients.

An outlay of Rs.250 millions was spent during 1975-76 to 1988-89 in Anantapur district to ameliorate drought conditions. Afforestation and pasture development under forest sector contributed towards drought proofing the district by developing land over an extent of 76065 ha.
Although the progress made under forest sector (towards drought proofing the district) is impressive, when compared to the rate of the degradation the development is not sustainable.

- The total area of wasteland amenable for development in the district is 442422 ha (23 per cent of the total geographical area). This holds a great potential for tree planting and bringing ecological balance to the district.

- The constraints in development of private wastelands have been: lack of faith in long gestation crops, lack of investment capacity, lack of assured market, lack of awareness and motivation, lack of financial assistance or incentives and legal formalities in harvesting and sale of resources created.

- Under seedling distribution programme, of the total seedlings lifted, the fuelwood and fodder species formed 70.62 per cent, M.F.P. and shade bearing trees 11.52 per cent, low value fruit 9.93 per cent, miscellaneous 6.16 per cent and green manure 1.77 per cent in that order.

- A total of 4.411 million seedlings were lifted by 17304 recipients from the ten selected nurseries. The average off-take per person was 255 seedlings. Recipients who lifted seedlings up to 50 formed 45.31 per cent, 51-100 category formed 11.31 per cent, 101-500 category formed 36.73 per cent, 501-1000 category formed 3.60 per cent and above 1000 category formed 3.05 per cent of the total recipients. The percentage of total seedlings lifted by the above categories were 5.65, 3.66, 48.26, 10.89, 31.54 respectively.
There was a significant difference in the quantity of seedlings lifted by different quantity groups and also in the number of recipients who lifted seedlings in these groups. The quantity group of 101-500 is the most preferred by 36.73 per cent of the beneficiaries and accounting for 48.26 per cent of the seedlings lifted. The most common quantify groups were 1-50 and 51-100 which together accounted for 57 per cent of the total recipients.

The average quantity of seedlings lifted by small farmer, marginal farmer, other farmer and institution was 162, 352, 326 and 786 respectively. Out of the total 17304 recipients, 9492 were small farmers, 3226 marginal farmers and 4071 other farmers. Institutions accounted for 515 recipients.

The 'F' test for the differences in the lifting of seedlings by different farming categories and the number of recipients in each category was non-significant. In the selected ten nurseries 75 per cent of the recipients belonged to small and marginal farmers categories and accounted for 61 per cent of the total seedlings lifted.

The recipients belonging to Scheduled castes and Scheduled tribes only 9.03 and 5.18 per cent. The percentage of seedlings lifted by these two categories was hardly 10 per cent of the total.

There was significant difference among the social groups of recipients in the pattern of lifting seedlings as well as in their number. The category of 'other farmers' were the most dominant with 85.79 per cent of recipients and accounting for 90 per cent of the seedlings.
Different case studies conducted in the district revealed that tree farming is economically and ecologically profitable.

Evaluation studies revealed that the survival of seedlings under free distribution scheme was about 28 per cent. Under incentive payment scheme, the survival percentage ranged from 47.8 per cent in 1989 to 94.3 per cent in 1990.

The survival percentage of seedlings showed a declining trend up to 3 years. Sustained motivational level through extension and technical guidance is essential to improve survival of seedlings up to 3 years.

Biomass studies in block and field bund plantations on private lands revealed that a felling cycle of six years is beneficial. Further, for economic biomass production, it is adequate to aim at 1800-2000 trees/ha at the time of harvest.

A total length of 221280 Km of field boundaries is available for supporting 110.6 million trees. At the rate of 9.6 Kg/tree/year, it is estimated that the 110.6 million trees would yield a biomass of 1.06 million tonnes every year.

The total annual fuelwood requirement of the district (0.7 million tonnes) could be met from the resource potential projected (1.06 million tonnes) on a sustained basis.

Pasture development is an important component in wasteland development. Under this programme effort was made to establish Cenchrus ciliaris in the past. Though Cenchrus ciliaris (Buffel grass) gave good
germination, it could not establish successfully because of soil and climatic conditions. However, the treatment given helped the production of indigenous grasses including Sehima nervosum. The quantity (dry matter) of palatable grasses increased from 310 Kg/ha in 1979 to 1850 Kg/ha in 1988.

- Under pasture development, along with Cenchrus ciliaris grass, top feed species like Babul, Neem, Sissoo, Dirisimun and Subabul were introduced to supplement fodder resources. Introduction of Stylosanthes hamata as a legume fodder yielded good results in pasture development.

- The quantity of fodder grasses harvested from the pasture plots was 1984 t during 1976-77, 2045 t during 1977-78 and 3201 t during 1978-79. The yield of the plots decreased from 3rd year onwards suggesting the need for introducing pasture legumes and fertiliser application for sustained fodder production.

- The percentage occurrence of palatable fodder in the pasture plots (under protected conditions) increased steadily up to 96 per cent. The dominant among the palatable species have been Heteropogon contortus (30.10 per cent), Stylosanthes hamata (23.38 per cent), Chrysopogon fulvus (16.90 per cent), Cymbopogon caesius (15.41 per cent) on average for the years 1988 and 1989.

- A comprehensive strategy to develop wasteland should include land capability classification and appropriate technology. People's participation is essential for effective wasteland development. The participation of people must start from the planning stage to harvesting stage. Therefore a more democratic and consultative approach is necessary.
- One Village Forest Worker (VFW) per mandal is insufficient to have an effective extension support for ensuring people's participation. It is important to have intensive training in extension technique for both the VFWs as well as the executive staff of the Forest Department and also the field level functionaries of allied departments like Agriculture, Soil Conservation, Animal Husbandry and Irrigation.

- It is essential that the organisational set up of the department be strengthened so as to lend a better extension support at lower levels.

- The incentive scheme under farm forestry needs to be integrated with other rural development programmes and should form a major component in the subsidized activities.

- Regulated market for transactions in wood and a minimum support or floor price for wood is essential for promoting tree cropping by farmers.

- It is essential that suitable species are selected and their genetic base improved in order to achieve better biomass production. Evolving superior quality planting material on a large scale through biotechnology methods, is very essential. Simultaneously, measures to conserve soil and moisture should be carried out and proper soil, water and vegetation relationship is ensured for improved soil productivity.